

Generic Detector R&D for an Electron Ion Collider

Advisory Committee meeting July 21-22, 2014

Thomas Ullrich (BNL)
July 21, 2014



Detector R&D for an Electron-Ion Collider

LRP 2007 Recommendation (“*Further into the Future*” section)

“We recommend the allocation of resources to develop accelerator and detector technology necessary to lay the foundation for a polarized Electron-Ion Collider.

NSAC 2013 Subcommittee Report on Scientific Facilities:

“The Subcommittee ranks an EIC as **Absolutely Central** in its ability to contribute to world-leading science in the next decade.”

“There are outstanding R&D issues that remain to be addressed in order to achieve performance metrics. ... Both laboratories are actively addressing R&D issues and are making good progress.”

EIC Detector R&D Effort

Goals of Effort

- Enable successful design and timely implementation of an EIC experimental program
- Develop instrumentation solutions that meet realistic cost expectations
- Stimulate the formation of user collaborations to design and build experiments

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Big Thanks to Tom !!!

EIC and the Long Range Plan

- April 2014: NSAC charged to produce a new LRP
- Town Meetings in late summer/fall organized through DNP
- QCD Town Meeting: joint JLab and RHIC/LHC community, i.e. hadron and heavy ion physics
 - ▶ Temple University, September 13-15, 2014
- LRP Resolution Meeting March/April 2015
- Report due October 2015
- EIC Input to LRP process
 - ▶ EIC White Paper (Physics Case)
 - ▶ MEIC and eRHIC CDRs
 - ▶ Reports from the Town Meetings

Message from Office on EIC: It's now or never!

EIC Detector R&D: Q3/4 FY2014

9 Projects

RD ID	Title	Contact	Institutions
RD2013-5	(Sub) 10 Picosecond Timing Detectors at the EIC	Mickey Chiu	Argonne National Laboratory, Brookhaven National Laboratory, Howard University, University of Illinois at Urbana-Champaign, University of Massachusetts at Amherst, Yale University
RD2011-3	DIRCbased PID for the EIC Central Detector	Pavel Nadel-Turonski	University of South Carolina, GSI, The Catholic University of America, Old Dominion University, Thomas Jefferson National Accelerator Facility
RD 2012-3	Design and assembly of fast and lightweight barrel and forward tracking prototype systems for an EIC	Bernd Surrow	CEA Saclay, Temple University, College of Science and Technology
RD2013-2	A Compact Magnetic Field Cloaking Device	Abhay Deshpande	RIKEN BNL Research Center, Stony Brook University, RIKEN, Brookhaven National Laboratory, Seoul National University
RD 2011-1, RD2012-14, (RD 1)	EIC Calorimeter Development	Huan Huang/Craig Woody	Brookhaven National Laboratory, California Institute of Technology, The Catholic University of America, Thomas Jefferson National Accelerator Facility, Indiana University, IPN Orsay, Pennsylvania State University, Texas A&M University, University of California at Los Angeles, University of Science and Technology of China, Yerevan Physics Institute
RD2011-6 (RD 6)	RD6 Tracking/PID Consortium	Klaus Dehmelt	Brookhaven National Lab, Florida Tech, Lawrence Livermore National Lab, Stony Brook University, University of Virginia, Weizmann Institute of Science, Yale University
RD2012-11	Development of a Spin-Light Polarimeter for the EIC	Dipangkar Dutta	Mississippi State University
RD2012-15	R&D for an Endcap TOF and TRD for Identifying electrons at EIC	Zhangbu Xu	BNL, Indiana University , USTC/China
RD 2013-6	Electron polarimeter a luminosity monitor and a low Q2 tagger	Elke Aschenauer	Brookhaven National Laboratory, Byelorussian State University, Cracow University of Technology

Budget Summary - July 15, 2014

EIC Detector R&D Funds Distributed

Account Number	Project Number	Institution	PI/Contacts	BNL Contract #	FY11	FY12	FY13	FY14
18950 (subcontracts)	RD 2011-1	UCLA	H.Zhong	198731	\$ 110,632	\$ 55,000	\$ 87,000	\$ 80,000
	RD 2012-14	Indiana University	Scott Wissink	244966			\$ 13,000	
	RD 2012-8 join 2012-14	USTC	Yifei Zhang	217054		\$ 60,000		\$ 35,000
	RD 2011-3	Jlab	P. Nadel-Turonski	201878	\$ 51,910	\$ 70,094		\$ 38,854
		The Catholic University	T. Horn	200821	\$ 9,800	\$ 8,300		\$ 8,300
		Old Dominion University	C. Hyde	199791	\$ 53,290	\$ 54,000		\$ 55,200
		University of South Carolina	T. Cao; Y. Ilieva	218624		\$ 7,606		\$ 12,646
	RD 2011-5	Jlab		200930	\$ 56,800			
	RD 2011-6	Stony Brook University	K.Dehmelt	200934	\$ 50,827	\$ 25,700	\$ 75,578	\$ 60,000
		Florida Institute of Technology	Marcus Hohlmann	200940	\$ 26,000	\$ 94,253	\$ 73,013	\$ 61,000
		University of Virginia	Nilanga Liyanage	200933	\$ 50,000	\$ 53,600	\$ 30,540	\$ 45,000
		Yale Univ	Richard Majka	200935	\$ 39,907	\$ 2,520	\$ 10,340	\$ 35,000
	RD 2012-3	Temple Univ/CEA-Saclay	B. Surrow	223228		\$ 125,000	\$ 25,000	\$ 295,108
	RD 2012-11	Mississippi State University	D. Dutta	227623		\$ 15,000		\$ 20,000
	RD2012-12	Jlab	V. Kubarovsky	229400		\$ 25,000		
	RD2012-13	Universidad Tecnica Federico Santa Maria, Chile	S. Kuleshov Will Brook	229667		\$ 46,000		
	RD2013-2	Stony Brook University	Abhay Deshpande	255667			\$ 72,220	\$ 65,000
	RD2013-5	Univ. of Illinois	Matthias Grosse Perdekamp	271376				\$ 60,000
	Subcontract total				\$ 449,166	\$ 642,073	\$ 386,691	\$ 871,108
	BNL Overhead for subcontracts				\$ 78,850	\$ 121,906	\$ 73,636	\$ 165,881
18950 Total	Total For subcontracts				\$ 528,016	\$ 763,979	\$ 460,327	\$ 1,036,989
16403	RD 2012-5	BNL-Thomas Ullrich				\$ 74,500	\$ 143,000	\$ 35,000
16412	RD 2012-9	BNL-Elke Aschenauer				\$ 173,000	\$ 14,551	\$ 196,397
16438	RD 2012-14	BNL-Craig Woody				\$ 45,000	\$ 112,000	
18963	RD2011-6	BNL-Craig Woody			\$40,000	\$ 51,000	\$ 69,000	\$ 59,000
16445	RD 2012-15	BNL-Zhangbu Xu				\$ 75,700		\$ 89,000
16499	RD 2013-5	BNL-M.Chiu						\$ -
16500	RD 2013-6	BNL-Elke Aschenauer						\$ 73,000
Total for EIC R&D					\$ 528,016	\$ 1,183,179	\$ 798,878	\$ 1,416,386

EIC R&D Advisory Committee & Input

Standing Advisory Committee:

Marcel Demarteau* (Argonne)

Carl Haber (LBNL)

Robert Klanner (Hamburg)

Ian Shipsey (Purdue)

Rick Van Berg (Penn)

Jerry Va'vra (SLAC)

Glenn Young (Jlab)

*chair

Received

- ▶ 11 Proposals
- ▶ 8 Progress Reports
- ▶ All available at: <https://wiki.bnl.gov/conferences/index.php/Proposals-July2014>

“Changes” to Program

- Only one (1) call for proposals per year
- Presentation of proposal during summer meeting May-July 20NN for funding in FYNN+1
- December/January meeting **only** for progress reviews
 - ▶ exception possible (but discouraged) in FY15 since new rule
 - ▶ after that only in true “emergencies”
- Implications
 - ▶ proposals have to cover full FY (Oct 1-Sep 30)
 - ▶ no second infusion mid FY
- Reasons
 - ▶ Simplification of funding process and planning for funding and receiving side
 - ▶ Avoid shortfalls in postdoc funding and avoids increasing confusion (with increasing # of projects and institutions)